

What Is Claimed Is:

1. A piezoelectric actuator having piezoelectric ceramic layers stacked to form a multilayer stack, an electrode layer being provided between each of the piezoelectric ceramic layers, an outer cover layer being provided on each end face of the actuator, and the piezoelectric ceramic layers and the outer cover layers each having a predetermined dielectric constant  $\epsilon_r$ ,  
wherein the outer cover layers (11, 16, 17) have a lower relative dielectric constant  $\epsilon_r$  than the piezoelectric ceramic layers (2) between the outer cover layers (11, 16, 17).
2. The piezoelectric actuator as recited in Claim 1,  
wherein the outer cover layers (11, 16, 17) are joined to the actuator (1).
3. The piezoelectric actuator as recited in Claim 1,  
wherein the outer cover layers (11, 16, 17) are each joined to a cover (15) of a cylinder (12) surrounding the actuator (1).
4. The piezoelectric actuator as recited in Claim 1,  
wherein the outer cover layers (16) are each adjacent to an electrode layer (3).
5. The piezoelectric actuator as recited in Claim 1,  
wherein the outer cover layers (17) are each provided on a ceramic layer (2).
6. The piezoelectric actuator as recited in Claim 2,  
wherein the outer cover layers (16) are manufactured from a piezoelectric ceramic.

7. The piezoelectric actuator as recited in Claim 4, wherein the relative dielectric constant ( $\epsilon$ ) of the ceramic of the outer cover layer (16) is decreased by admixture of additives.
8. The piezoelectric actuator as recited in Claim 3, wherein the outer cover layers (17) are each joined to a ceramic layer (2) by coating, gluing or soldering.
9. The piezoelectric actuator as recited in Claim 3, wherein the outer covers layers (17) are each manufactured from quartz, a glass, an adhesive, a lacquer, a solder or silicon dioxide ceramic.
10. The piezoelectric actuator as recited in Claim 3, wherein the outer cover layers (17) are designed to be rigid and inelastic.